AN OBSERVATIONAL STUDY ON HUMAN CORONARY ARTERIES IN TAMIL NADU ADULT AND FOETAL POPULATION

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ABSTRACT

The term ‘coronary’ stems from a Latin word *‘corona’* which denotes crown. These vessels were entitled so, owing to their crown like architecture at the base of the heart. Despite several decades of rigorous scrutiny, exploration and fact-finding on these arteries, there still lingers controversies appertain to the various factors that influence the origin, diameter, length, branching and termination of these arteries and also the role of these arterial parameters in enhanced disease susceptibility, disease pathogenesis, accelerated progression of diseases, postoperative complications, prognosis, morbidity and mortality.

The detailed knowledge about anatomy, morphometry, variations and congenital anomalies of coronary arteries is cardinal. This observational study of sample size 150 is targeted at observation and clinical correlation of anomalous coronary arteries and also at overcoming the inadequacy of anatomic and morphometric data of the coronary arteries in this particular geographic locale – Tamil Nadu, India.

Ethical clearance was obtained from IHEC (Institutional Human Ethics Committee).

RESULTS:

The incidence of coronary artery anomalies in current study in dissected adult cadaveric heart specimen was 4 %. It was compared with that of the other reference studies ***(Table 2)***. The other studies in India depicted a lesser incidence. The anomalies present were absent left circumflex artery (n = 1) and origin of right coronary artery from pulmonary artery (n = 1).

The cardiac dominance percentages observed in current study were

Sample	Sample size	Right dominant %	Left dominant %	Co dominant %
Dissected foetal cadaveric heart specimens	50	**48**	**46**	**6**
Dissected adult cadaveric heart specimens	50	**50**	**42**	**8**
Coronary Computer Tomography angiograms	50	**52**	**44**	**4**

The ostium of right coronary artery was below the sinotubular ridge in 100% dissected adult cadaveric heart specimens. The ostium of left coronary artery was also below the sinotubular ridge in 100% dissected adult cadaveric heart specimens.

The mean diameter of left main coronary arteries, proximal segment of left circumflex arteries, proximal segment of left anterior descending arteries and proximal segment of right coronary arteries in dissected adult cadaveric heart specimens were 3.32mm, 3.03mm, 2.56mm and 3.18mm respectively. The mean diameter of left main coronary arteries, proximal segment of left circumflex arteries, proximal segment of left anterior descending arteries and proximal segment of right coronary arteries in coronary computer tomography angiograms were 3.92mm, 3.14mm, 3.03mm and 3.35mm respectively. On comparing the measured mean diameters between males and females, the values were higher in males than females.

The mean length of left main coronary artery was 9mm in dissected adult cadaveric heart specimens and 9.92mm in coronary computer tomography angiograms.

The percentages of short, medium and long left main coronary artery in our study were

Sample	Left main coronary artery %		
	Short	**Medium**	**Long**
Dissected adult cadaveric heart specimen	**6.12**	**91.84**	**2.04**
Coronary computer tomography angiogram	**6**	**92**	**2**

The terminal branching patterns in current study are

Sample	**Sample size**	**No. of terminal branches of left main coronary artery (%)**		
		2 (%)	**3 (%)**	**4 (%)**
Dissected foetal cadaveric heart specimens	50	**84**	**12**	**4**
Dissected adult cadaveric heart specimens	50	**87.8**	**8.2**	**4.1**
Coronary Computer Tomography angiograms	50	**92**	**8**	**0**

The artery terminated at the obtuse margin in 18.4%, between the obtuse margin and the crux in 28.6%, at the crux in 44.9% and between the crux and acute margin in 8.2% dissected adult cadaveric heart specimens. Left anterior descending artery terminated before reaching or at the apex in 90% and crossed the apex to enter and run in the posterior interventricular groove 10%. The artery terminated between the acute margin and the crux in 12%, at the crux in 26% and between the crux and obtuse margin in 62% dissected adult cadaveric heart specimens.

CONCLUSION:

The morphology and morphometry of the coronary arteries were elaborately discussed in the realms of its origin (number, source artery, aortic sinus, and level), course, branches, dominance, diameter, length, extent and level of termination. The total and gender-based frequencies of dominance were analysed. The total, gender-based and dominance-based frequencies of number of terminal branches of left main coronary artery were calculated and compared. The total, gender-based and dominance-based means were calculated for the length and measured diameters, compared and analysed (statistical significance and statistical correlation). The normal range of values in the current study are essential for interpreting angiograms, designing stents, disease diagnosis and disease prognosis in the current locale; the observation regarding increased incidence of congenital anomalies in the study locale is essential for genetic research, for drafting guidelines to suspect and prevent sudden cardiac death and for devising an efficient investigatory modality to screen for congenital anomalies on a large scale; the differences in values between males and females calls for special precautions in female subgroup.

KEYWORDS: coronary arteries, origin, branches, diameter, length, termination congenital coronary artery anomalies, sudden cardiac death